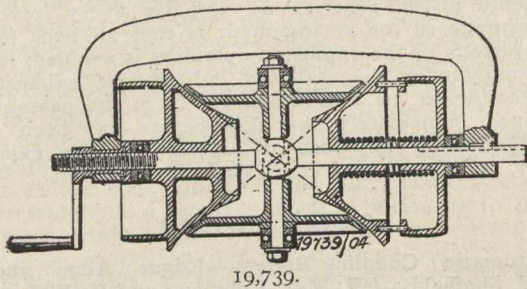
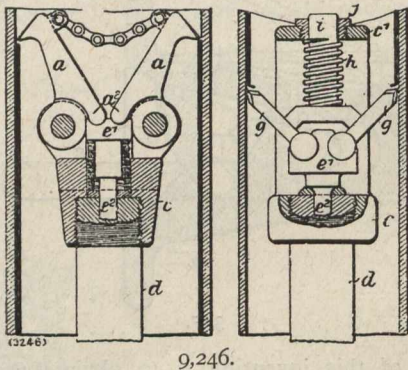


to move endwise by the screw and handle gear shown, and a spring is placed behind one of the cones to keep the gearing surfaces tight.

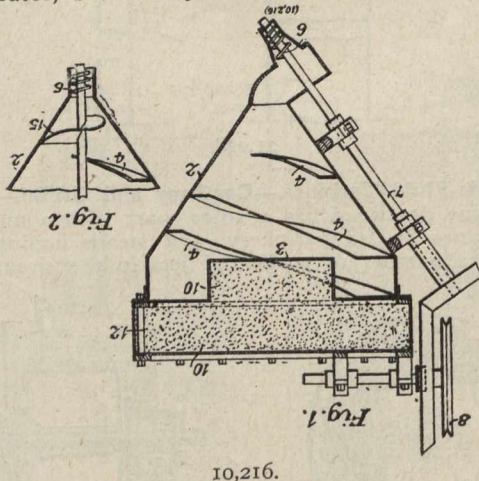


**Tube Scrapers.**—S. M. Cockburn, J. R. Temperley, and J. Temperley, London.—9,246.—This invention relates to a contrivance for breaking and removing the incrustation which adheres to the interior surface of tubes, particularly the tubes of water-tube boilers, *a, a'* are two scaling tools oppositely pivoted on a socket *c*.



which is secured to a tubular arm *d*, which contains the mechanism of a pneumatic hammer and serves as a medium for the conveyance of energy by fluid under pressure and as means for manipulating the tool and causing it to effect the desired result at every part of the internal surface of the tube.

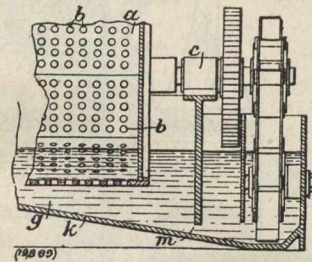
**Pneumatic Dust-Collectors.**—W. Tattersall, Bradford, Yorks.—10,216.—This invention relates to improvements in or appertaining to pneumatic dust-collectors, and its primary object is to more thoroughly separate the dust from the air. The apparatus consists of a dust-separator 2, which may be of the usual inverted cone type fitted with deflectors 4 to precipitate the dust to the narrow end of the cone. At or near the bottom of the cone a worm or helical conveyor 6 is provided to discharge the dust when such worm is rotated. This worm is preferably inclined at a suitable angle, so that the shaft 7 of the driving mechanism 8 is outside the separator, but it may be vertical. The worm may be



taper or reduced in diameter towards the discharge end, so that the dust delivered is more or less solidified, and will not immediately become disintegrated under ordinary conditions. Provision is made for throwing the discharge worm in and out of action, as required. An auxiliary opening may be provided, so that the dust can be discharged independently of the worm. In connection with the air-outlet 3 a filtering medium 10 is introduced, formed of layers of fibre and cotton-wool or other suitable medium, through which the air is forced before escaping; and in order to increase the efficiency of this filter the air-outlet is enlarged in size at this point, so as to obtain a large filtering area 12 and proportionately reduced velocity of the air. For the purpose of dealing with certain kinds of dust, such as those liable to cling to the sides of the separator, a rotary scraper 15 is

used, as shown in Fig. 2, which is a view of the lower portion of a dust-separator similar to Fig. 1, but with the shaft 7 of the driving mechanism vertical, to scrape the sides of the separator. This scraper may be of such a form that it also acts as a deflector.

**Cleaning Castings.**—S. W. Wells, Keighley.—19,869.—This invention relates to machines or apparatus for cleaning metal castings, and consists in constructing and arrang-



ing the parts forming said machines or apparatus so that the sand and other matter adhering to castings coming from the sand mould on being treated thereby are entirely removed therefrom, and received by receptacles from which such sand or refuse can be easily discharged.



## CANADA AND U. S. TRADE COMPARISONS.

In making comparisons between the trade of Canada and that of the United States, the mistake is frequently made of underestimating the Canadian rate per capita, which in reality is greater than the rate per capita in the Republic. Although the population of Canada is only about 6,000,000, whereas the people of the United States number probably 85,000,000, and the total volume of trade of the latter country is vastly larger than ours, still when the relative rate of progress made by the two countries is figured accurately on the basis of population, many would no doubt be surprised to find that the development of the Dominion is proportionately greater and more rapid than the growth of the United States.

A century ago the population of Canada was in the neighborhood of 340,000, while in 1800 the population of the United States was 5,308,483, or 166 for every 10 in this country, and it will be interesting to examine briefly some of the conditions existing then and now, proportionately.

In 1800 the United States with a population of 5,308,500, had a total foreign trade of \$162,224,500. The foreign trade was equal to \$30.50 per head.

In 1905, with a population of 83,145,000 the United States foreign trade was \$2,636,074,350. This is equal to \$31.70 per head.

Increase of American foreign trade in 105 years, \$1.20 per head.

In 1800 Canada, with a population of 320,000, had a foreign trade of about \$900,000. The foreign trade was equal to \$2.80 per head.

In 1904, with a population of 5,500,000, the foreign trade of Canada was \$454,645,700. This is equal to \$82.67 per head.

Increase in Canada's foreign trade in 105 years, \$79.87 per head.

The United States have built up a foreign trade equal to \$31.70 per head, while Canada, handicapped in various ways, has built up a foreign trade of \$82.67 per head, or a considerable amount more than double per head that of the United States.

In regard to population the increases respectively have been as follows:

In 105 years the increase of population in the United States has been 16 2-3 times.

In 105 years the increase of population in Canada has been about 17 times.

Canadians have reason to feel proud of the splendid record the country has made, and the manner in which we are forging ahead to-day in the commercial world.—The Commercial, Winnipeg.